

AIWorks is DEP's AI-native simulation platform — a complete, workflow-based suite that spans the entire journey from data generation for AI training, to creating AI models, deploying them, and running AI-powered optimization. It is developed and deployed by practicing CAE engineers, making it deeply aware of real engineering needs across structural, crash, CFD, NVH, thermal, and multidisciplinary domains.

DEP AIWorks is architected as an end-to-end AI workflow — not a collection of standalone tools. The platform maps directly to the full product development cycle: generate diverse training data → organise and analyse it statistically → train surrogate models → predict responses → optimise designs → deploy AI agents for autonomous execution. This workflow has been validated across Automotive OEMs, Aerospace, Railways, Energy, Electornics, and Heavy Equipment programmes globally.



Simulate. Predict. Optimize

**Physics-driven Predictive & Generative
AI To Transform Product Development**



The AI Intelligence Layer For Engineering

10x

Simulation Speed

<3%

AI Prediction Error

250+

Models From 1 Baseline

AIWorks Differentiator



Problem-Class Architectures

Separate neural network architectures tuned for mildly, moderately, and highly nonlinear problems. CFD, structural, and crash each get purpose-built models — not a single generic architecture.



Physics in the Loss Function

Engineering physics — FE equations, Navier-Stokes, LES — embedded directly in the neural network training loss. Surrogates remain physically consistent, not just statistically fitted to training data.



Equivalence Scoring

Every AI prediction carries an equivalence score — quantifying how closely the new design sits within the training envelope. Low-confidence predictions flagged before they influence design decisions.



AI Training Data at Scale

Parametric CAE, concept modelling, and ROM-accelerated solvers generate hundreds of high-fidelity variants rapidly — feeding AI training pipelines with the volume and diversity needed for robust surrogate performance.



Voxelisation-Based Intelligence

Patented voxelisation processes hundreds of designs simultaneously — mapping geometry, thickness, and result fields into a unified statistical space. Surfaces input-output relationships invisible to standard post-processing.

Validated Accuracy Benchmarks

Aero/Drag Coeff. - **<3% Error**

Body Stiffness - **<3% Error**

Crash/Impact - **95% + R² Score**

NVH/Frequencies - **<5% Error**

AIWorks – The End-To-End AI Workflow



Data Generation: Generate hundreds of simulation-ready variants from a single baseline model. Combines parametric FE model changes, concept modelling (new BOM sketching in minutes), and morphing — feeding the AI pipeline with rich, diverse training data.

Data Analysis: Intelligently analyses simulation data — input decks, results, variants — across projects and teams. Voxelisation-based patented technology enables robotic scanning of hundreds of models to surface geometry, thickness, and material changes statistically. Cause-vs-effect design intelligence built in.

PINN Adaptive Training: PINN embeds the actual physics — FE equations, Navier-Stokes, LES — directly into the neural network training loss. The result: accurate extrapolation beyond training data, robust performance on new geometries, and meaningful uncertainty indicators.

Predict: Train AI/ML models on simulation data. Predict stress, frequency, drag, displacement responses in seconds — without full solver runs. Deploy as fast solvers within the optimisation loop, reducing computational cost by orders of magnitude.

Optimize: Run MDO loops across crash, stiffness, NVH, CHT, and CFD disciplines simultaneously. The Optimizer invokes physics-driven or AI-based solvers per response — automatically.

Simulate-AI

CAE Data Creation

Adaptive Trainer

Predictor

Auto Parametrizer

Optimizer

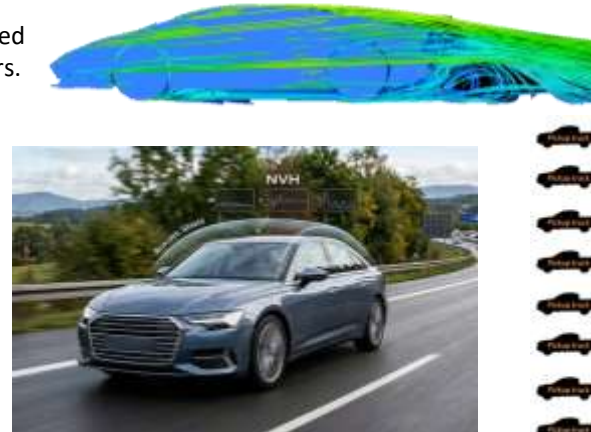
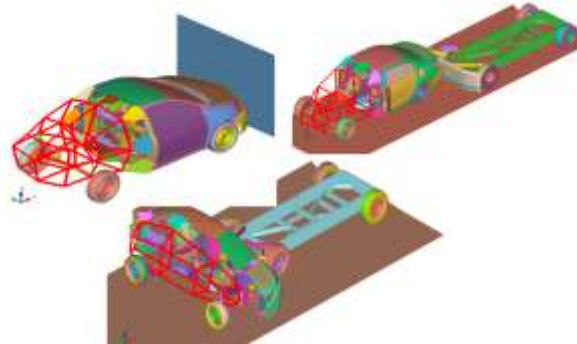
Gen-AI

Enterprise Data Connector

Physics-Informed Neural Networks (PINN) trained per load case — graph-convolutional architectures with embedded physics loss functions (FE equations, Navier-Stokes, LES). Predicts scalars, time-history curves, and full 3D field contours.

Tech Application Highlights

- Structural stiffness prediction
- Crash & impact (non-linear)
- CFD / Aerodynamics
- NVH / Frequencies
- 3D field prediction (stress, pressure)



Features-AI

CAE Parametrization

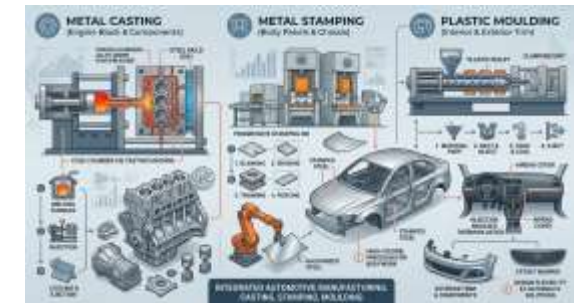
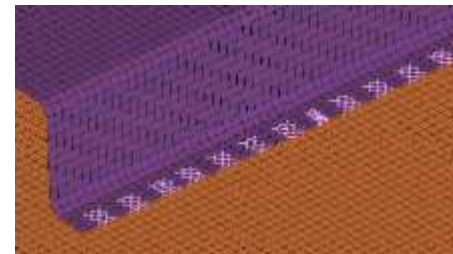
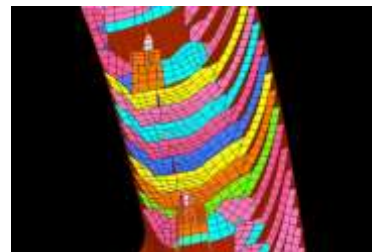
Adaptive Trainer

Features Recognition

Automated recognition and parametrization of engineering geometry features across assemblies. Drives intelligent data creation and concept generation without returning to CAD.

Tech Application Highlights

- Auto feature recognition
- Rib, boss, fillet, weld detection
- Feature-count parametrization
- AI-assisted concept generation
- Multi-process: casting, stamping, moulding

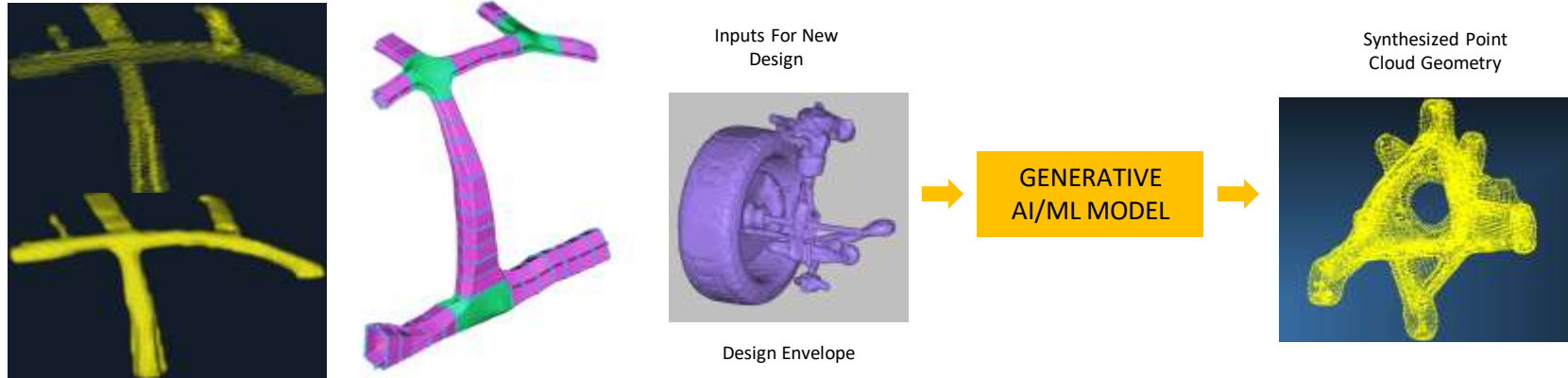


Gen-GEOM

Generative geometry meets AI prediction. Modify CAD shapes, get instant AI re-prediction — no re-meshing, no solver queue. Automated sub-model generation, generative topology at mesh level, and digital twin creation from manufactured scan data.

Tech Application Highlights

- Real-time CAD morphing + re-prediction
- Generative topology (no CAD)
- Digital Twin from scan mapping
- Multidisciplinary shape optimisation
- Sub-model auto-generation



Agentic-AI

Natural Language Data Creation

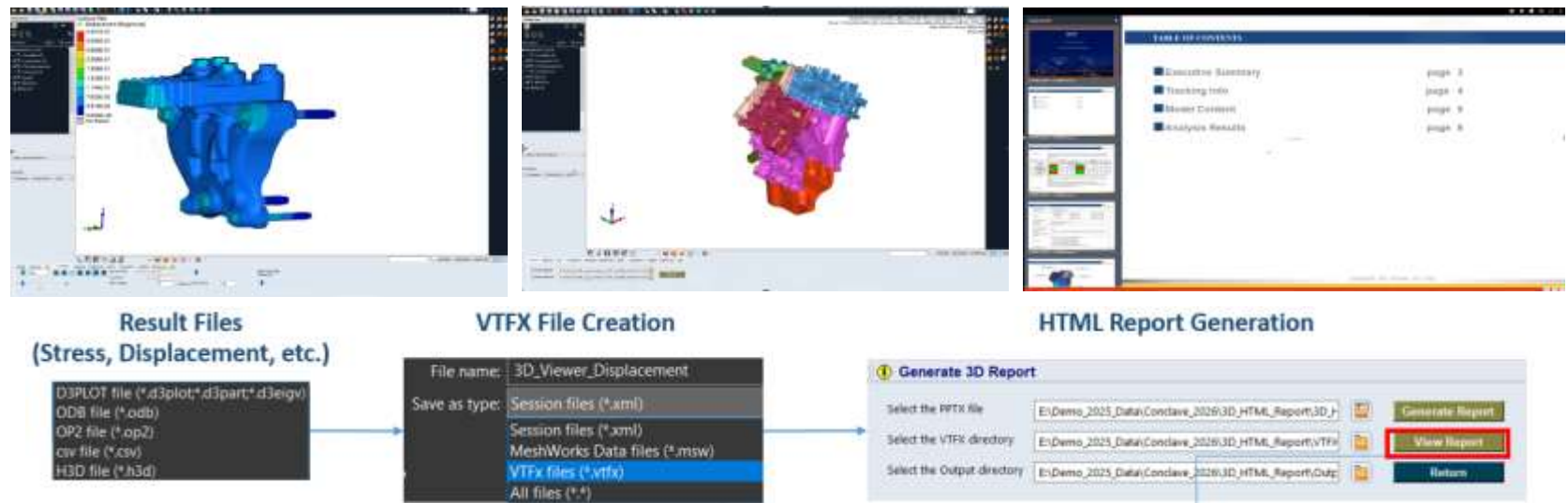
Adaptive Trainer + LLM

Agents

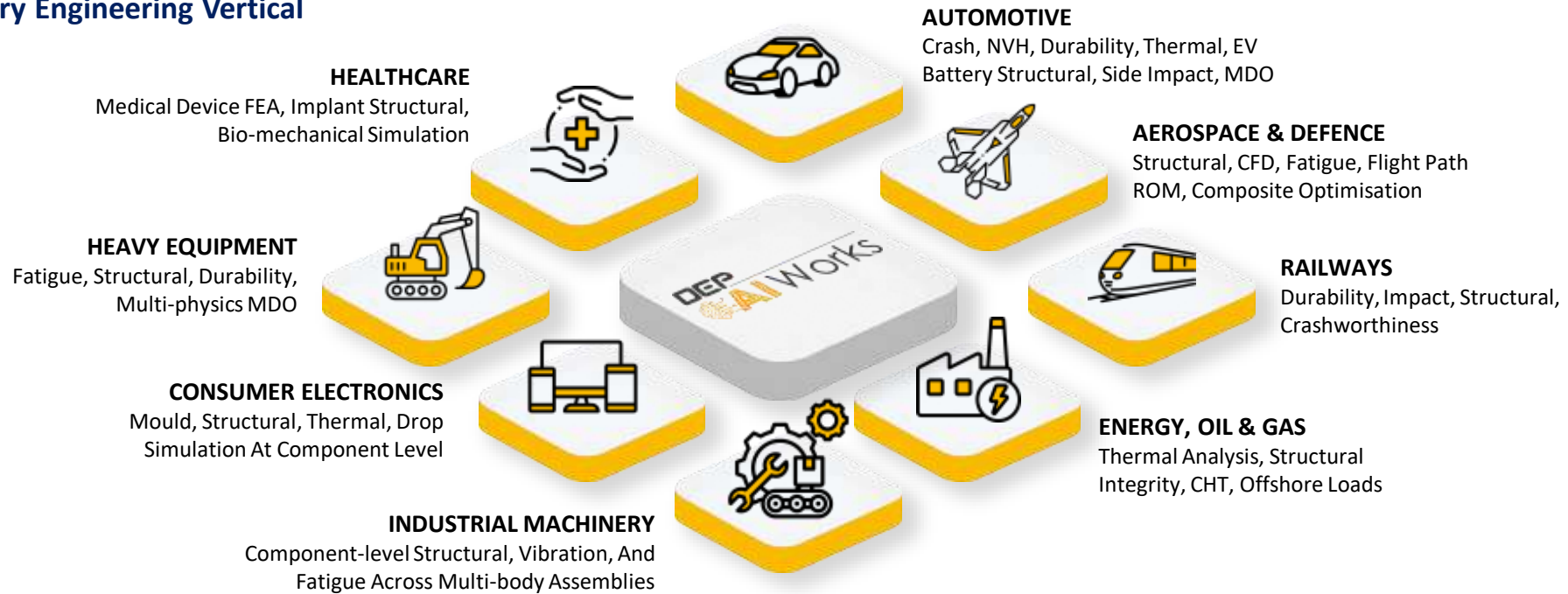
Autonomous simulation agents orchestrate multi-step CAE workflows — queuing solvers, monitoring convergence, running optimisation loops, synchronising multi-discipline variables, and auto-generating 3D-embedded reports.

Tech Application Highlights

- Multi-solver orchestration
- Autonomous optimisation loops
- Multi-discipline synchronisation
- Process automation & publishing
- Auto 3D-embedded report generation



Built for Every Engineering Vertical



Built for Every Simulation Engineer



CAE / FEA ENGINEERS

Structural, crash, durability, and fatigue specialists can replace multi-day solver runs with sub-minute AI predictions across multiple load cases simultaneously.



CFD / THERMAL ENGINEERS

Aerodynamics, CHT, and cabin comfort engineers can do drag prediction in 2 minutes vs. 3-week CFD queue. 3D pressure field results generated on demand for new styling geometries.



SIMULATION TEAM LEADS

Engineering managers can build AI-ready CAE organizations - from data strategy and model governance to agentic workflow deployment at scale across multiple product lines.



CAD / DESIGN ENGINEERS

Product designers can use geom AI to morph geometries and re-predict performance in real time — closing the loop between styling and simulation on the same day.



NVH / ACOUSTICS ENGINEERS

Trimmed body frequency optimization, acoustic performance improvement achieved with — AI-predicted natural frequencies at sub-5% error across wheelbases and roof configurations.



AI / ML ENGINEERS IN INDUSTRY

Data scientists applying ML to physical simulation data can leverage DEP's pre-trained PINN architectures tuned specifically for mildly, moderately, and highly non-linear engineering problems.



READY TO TRANSFORM
Your Simulation Workflow?



Request A Live Demo



Schedule A Pilot Programme



Talk To Our CAE Expert



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Email us: email@depusa.com | Visit our Website: www.depaiworks.com

USA: MI (HQ) : Detroit Engineered Products, 850 East Long Lake Road, Troy, MI 48085, USA. I Phone: +1-248-269 7130

INDIA (CHENNAI) : DEP India Pvt. Ltd., #2/86, 7th Avenue, Ashok Nagar, Chennai – 600 083, India I Phone: +91 44 42141453

INDIA (BANGALORE) : DEP India Pvt. Ltd., 4th Floor, Gamma Block, Sigma Soft Tech Park, HAL – Whitefield Main Rd, Bangalore 560066